



#### CASE STUDY SUMMARY

The Comerica building was retrofitted with energy-efficient lighting and an enhanced energy information system.

- Participant:  
Macanan Investments
- Building Type:  
Large office building
- Site Size:  
213,500 ft<sup>2</sup>/  
700 occupants
- Project Cost:  
\$358,000
- Project Incentives:  
\$78,539
- Primary Benefit:  
Access to energy and  
demand data

## Enhanced automation allows Macanan Investments to track energy use and demand for each tenant.

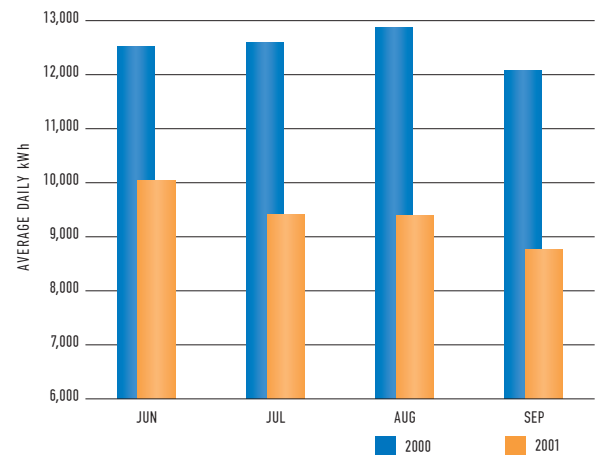
**T**he arrival of the California energy crisis found Macanan Investments, the owner of the Comerica building, and their tenants, already concerned about rising energy costs and rolling blackouts. Through a California Energy Commission program, Macanan Investments was able to enhance the building's lighting controls and energy information system. These measures helped reduce energy use by an average of 34 percent during the 2001 peak demand period compared to the previous year, while maintaining tenant comfort.

- Rising electricity costs
- Unpredictable energy supply

## PROBLEM

At the time the California energy crisis hit its peak, Macanan Investments, the property management company that developed and owns the Comerica building, had already become concerned about rising energy costs and rolling blackouts. Their concerns were legitimate: In the summer of 2001, the building's electricity rate went up by 41.6 percent. The reliability of the region's electricity supply had also become a consideration, given the number of rolling blackouts occurring throughout the State. In May of 2001, the reliability issue hit home when the Comerica building experienced a rolling blackout.

## Comerica Building Energy Use



*The above graph illustrates the reduction in electricity usage (kilowatt-hours) achieved by reducing lighting levels and increasing temperature set points in the Comerica building during the peak demand months of 2000 and 2001.*

- State-of-the-art efficient lighting
- Enhanced energy information system

## SOLUTION

Macanan Investments decided to participate in a California Energy Commission program that offered funding for the installation of enhanced automation technologies that would reduce the building's energy use and enable the building to quickly curtail load during an emergency shortage. They participated in the program through Global Energy Partners (GEP), an administrator of the California Energy Commission funds. Together, GEP and the building owner developed a project that added wireless controls to the building's dimmable lighting system and enhanced the capabilities of their energy information system (EIS). In addition to decreasing energy costs and providing technical benefits, these enhancements enabled the building owner to save additional money by participating in a utility rebate program.

*"With this one project, we have increased building value and accomplished a desirable social objective. Very satisfying."*

*"Because of our new metering capability, we have greater understanding of and control over our energy costs, and are able to more effectively manage our budgets."*

John Buchanan  
General Partner  
Macanan Investments



*"These enhancements are saving us and our tenants money and have raised our awareness about the importance of energy management."*

- Lower energy demand and costs
- Ability to benefit from incentive programs
- Flexible, enhanced lighting system
- Increased building value

## BENEFITS

The building system enhancements helped reduce energy use in 2001 by an average of 34 percent during the peak demand period (June – September) compared to the previous year. The new EIS, which has enabled the owner to closely monitor and adjust their energy use, has contributed significantly to these savings. Because the building's utility interval meter was connected to the Internet, the owner can now, from a password-protected Web site, access energy use (kWh) and demand (kW) data in 15-minute increments at any time. The building owner can therefore factor tenants' energy demand and time of use into their rental charges.

The building's new wireless lighting control devices can be activated remotely in less than a half an hour by paging signals that are initiated from a Web site. This technology, along with the new EIS, allows the building owner to participate in demand-responsive programs that offer per-kW incentives for peak load reductions during electricity shortages. A test of this system resulted in the successful curtailment of 65kW of peak demand.

One of Macanan Investments' goals for the project was to participate in Pacific Gas and Electric Company's 20/20 Rebate Program, in which customers who reduced their 2000 summer peak period electricity use levels by at least 20 percent during the 2001 summer peak period received a rebate of 20 percent off their monthly electricity bill. By reducing lighting levels and monitoring the associated demand reductions, the owners achieved a 20 percent reduction for four consecutive months, resulting in an incentive payment of \$14,539.



## PROJECT SITE DESCRIPTION

- Location:  
San Jose, California
- Size:  
213,500 ft<sup>2</sup>
- Space Function:  
Office space
- Number of Occupants:  
700
- Building Owner:  
Macanan Investments
- Site Contact:  
Sue Cam  
Property Manager

## Energy Usage

- Peak Demand:  
650 kW
- Curtailable Demand:  
65 kW

## Equipment Installed

- T-8 lamps
- Dimmable ballasts
- Lighting control panels
- Internet gateway

## Project Cost

- \$358,000

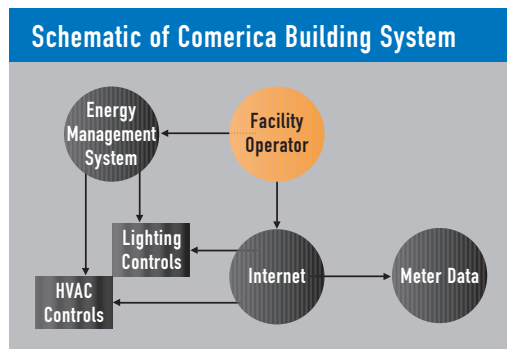
## Project Incentives

- \$78,539



# Technical Information

**M**acanan Investments' enhanced automation project involved connecting the building's dimmable lighting ballasts to wireless, pager-activated control devices. On each floor, the ballasts are connected via a low-voltage loop to a control panel that has three relays. Each relay corresponds to a lighting setting—the first operates the lights at 82 percent of normal output, the second at 72 percent, and the third at 62 percent. The 62 percent level was intended for use during emergency curtailment situations only, but owners found they could operate lights at this level during peak afternoon hours without disrupting occupancy comfort. During the remainder of the day, the first two settings are used and at night the lights are swept off. The lighting system now never needs to operate at 100 percent capacity; and because the building has recently been retrofitted with a high efficiency T-8 lighting system, the light output remains at or near pre-retrofit levels.



On each floor, the light levels are programmed and connected to a time-clock system. A dedicated relay is connected to the wireless load control devices so that the lighting system can be powered down quickly from the Internet during an emergency electricity shortage. Building operators can also schedule the regular operation of lighting and HVAC equipment over the Internet from a password protected Web site at [www.energy1st.com](http://www.energy1st.com). The building's Trimax energy management system (EMS), which had been in place prior to the project, is used to turn on/off lights on each floor according to tenant operating hours. It is also used to control the thermostats that dictate the operation of the building's HVAC system. To achieve even greater savings during peak demand months, building operators raised thermostats via the EMS to increase the temperature of the HVAC system's chilled-water supply by six degrees.

Macanan Investments further improved the efficiency of their building by adding a more sophisticated energy information system (EIS). The utility meter is now connected to an Internet gateway that collects meter pulses and translates the pulses into demand data. This demand data is available in near-real time from the Web site at [www.energy1st.com](http://www.energy1st.com). It is also available the next day in the form of statistics, charts, and graphs from a password-protected Web site maintained by Infotility, Inc., at [www.power-pact.com](http://www.power-pact.com). ESC Engineering Services, of Half Moon Bay, CA, worked closely with the building manager to incorporate these capabilities and use them to track the impacts of energy efficiency measures.

## TAKING THE NEXT STEP

Free resources are available from the California Energy Commission.

- Business Case Guidebook
- Technical Options Guidebook
- Contractor and Vendor Lists
- Technical Assistance
- Case Studies

- 1 Alameda County  
HVAC Controls/  
Government Facility
- 2 Hewlett-Packard  
Company  
HVAC and Lighting Controls/  
Office Campus
- 4 Foothill-De Anza  
Community Colleges  
HVAC and Lighting Controls/  
College Campuses
- 5 Staples, Inc.  
HVAC and Lighting Controls/  
Retail Chain
- 6 Doubletree Hotel  
Sacramento  
HVAC and Lighting Controls/  
Hotel and Convention Center

Contact us for free materials or for further information:

- 1-866-732-5591
- [enhancedautomation@xenergy.com](mailto:enhancedautomation@xenergy.com)
- [www.ConsumerEnergyCenter.org/enhancedautomation](http://www.ConsumerEnergyCenter.org/enhancedautomation)

## Additional Resources

- California Energy Commission  
[www.energy.ca.gov/peakload/index.html](http://www.energy.ca.gov/peakload/index.html)
- Cash for Kilowatts Web site  
[www.energy.ca.gov/peakload/cash\\_kilowatts.html](http://www.energy.ca.gov/peakload/cash_kilowatts.html)  
(also for 50-200 kW demand)
- Your local utility
  - [www.sdge.com/business/drpf.html](http://www.sdge.com/business/drpf.html)
  - [www.pge.com/003\\_save\\_energy/003b\\_bus/index.shtml](http://www.pge.com/003_save_energy/003b_bus/index.shtml)
  - [www.sce.com/sc3/002\\_save\\_energy/002i\\_load\\_redn/default.htm](http://www.sce.com/sc3/002_save_energy/002i_load_redn/default.htm)